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Brief 71-10435

NASA TECH BRIEF

Marshall Space Flight Center

Cartesian-Coordinate Dimensioning for Plumbing Systems

The Problem:

To devise a nonprogressive dimensioning method that would avoid tolerance accumulation in detail drawings of precision plumbing and ducting components.

The solution:

Specify the cartesian coordinates for each critical point in the part.

How it's done:

The X, Y, and Z coordinates are determined for the tube centerline at each terminal point, bend, and joint. These coordinates are called out on the drawing instead of the usual length, bend radius and bend angle dimensions.

The method permits the direct fabrication of tubing shapes that conform to requirements determined by layout and design, without necessitating the generation of a preproduction tubing mockup and subsequent preparation of a hard master part from the mockup. Dimensional tolerances are easily controlled, assuring the prescribed clearance between adjacent components, the proper mating of interfaces, and the required alignment with tubing supports. The method is independent of bend radius and is therefore free from the effects of indeterminate post-forming-springback radius changes that cause large variations in parts formed according to conventional, radius-dependent dimensioning.

Note:

Requests for further information may be directed to:

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Patent status:

No patent action is contemplated by NASA.

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